'Trusting the numbers': mineral prospecting, raising finance and the governance of knowledge

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Abstract

Mineral prospecting and raising finance for 'junior' mining firms has historically been regarded as a speculative activity. For the regulators of securities markets upon which 'junior' mining companies seek to raise capital, a perennial problem has been handling not only the indeterminacy of scientific claims, but also the social basis of epistemic practices. This paper examines the production of a system of public warrant and associated knowledge practices intended to enable investors to differentiate between 'destructive' and 'productive' varieties of financial speculation. It traces the use of the notion of 'disclosure' in constructing and legitimizing the 'juniors' market in Canada. It argues that though the work of 'economics' may be necessary in the construction of markets, it is by no means sufficient. Attention must also be given to the ways in which legal models of 'the free-market' can be translated and constantly re-worked across the sites and spaces of regulatory practice, animating the geographies of markets.

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Introduction

In 2004 the International Accounting Standards Board (IASB) set up an international project to research financial reporting practices for the extractive industries, encompassing exploration, evaluation, development and production activities. The project team drew together staff from the national accounting standards setters of Australia, Canada, Norway and South Africa, who were tasked with developing a framework for the harmonisation of accounting, valuation and disclosure models for non-regenerative resources. In prefacing their recommendations, the project team noted that 'extractive activities are subject to several significant uncertainties. During exploration it is common to have insufficient data to evaluate whether a deposit of minerals or oil and gas will be developed and will generate future net cash inflows from extraction and sale … these uncertainties revolve around the quantity … that can be extracted given the geological, technical and economic conditions. … [Moreover] there is no direct relationship between the risks and rewards of a particular exploration programme' (IASB 2010, 15). Indeed, historically financing mineral exploration firms has been regarded as a highly speculative activity. In part this stems from what Braun (2006) has characterised as 'the intransigence of nature' (p.202), the ways in which the physical qualities of geological phenomenon pose particular barriers to commodification processes. However, it also stems from how those promoting the sale of shares in exploration companies exploit in an entrepreneurial fashion the articulation of prospectors' provisional knowledge claims with a range of culturally specific sets of commitments and practices, 'conjuring' economic potential, animating speculative capital flows (Tsing 2005). Consequently, for market participants a perennial problem has been not only handling the indeterminacy of scientific claims based upon field surveys, exploration drilling, chemical assays and inference, but also the social basis of these epistemic practices (Schaffer 2002). This paper examines the construction of a regime to standardize the disclosure and circulation of information considered material to the valuation of shares in these sorts of enterprises, that is, the production of a system of public warrant and associated knowledge practices intended to enable investors to differentiate between 'destructive' and 'productive' varieties of financial speculation (Preda 2009). It focuses on the world's largest equity market (by number of listings) for mineral exploration or 'junior' mining firms – Canada – tracing the use of the notion of 'disclosure' in the construction and legitimization of this market.

The rule of markets

In a recent review of the 'geographies of markets', Berndt and Boeckler (2010) have argued for more research on 'how exactly markets and other economic entities are put to work' (p. 599). Driving this project is concern that markets are too often taken-for-granted in geographical scholarship and the social sciences more generally. Over the past ten years transdisciplinary scholarship has eschewed notions of 'the market' and begun to view markets as bundles of practices and material arrangements always in the making (Callon 1998; MacKenzie 2006; Mackenzie et al. 2007). This work has queried the processes through which particular ideas, objects and spaces are qualified as 'economic', directed our attention to the processes by which markets are constituted through particular socio-technical arrangements and problematized how market orders emerge and expand (Caliskan

and Callon 2009; 2010). As recently acknowledged, common threads that bind together much of this research on 'geographies of marketization' are the 'concrete translation processes which see to it that economic and social realties are brought into line with laboratory conditions, in so doing allowing the radical project of neoclassical economics to realize itself' (Berndt and Boeckler 2011, 1058). In understanding these translation processes, emphasis has been placed on the role of economists (whether 'confined' or 'in the wild') and things ('market devices') (Callon et al. 2002; MacKenzie et al. 2007, 311-357). As a consequence, this paper argues, often glossed over is the significance of the 'methods of control and trials of strength' (Mitchell 2007, 245) embedded within the design and deployment of 'economic' arguments and calculations. Though the work of 'economics' may be necessary in the construction of markets, it is by no means sufficient (see Mitchell 2002; Parry 2004; Blomley 2008; Mansfield 2008). Emphasis on 'economics' and associated calculative arrangements alone often takes much for granted in the workings of private regimes of self-regulation, their relationship with the state and wider legal processes in shaping market-like rule.

For example, MacKenzie's (2001; MacKenzie and Millo 2003) path-breaking discussion of option pricing and the development of modern financial markets, casts necessary moral and legal boundary work as points of departure. Outlining the social, cultural and political 'conditions of felicity' that explain the Black-Scholes-Merton model's success at the Chicago Board Options Exchange, MacKenzie places emphasis on the growing authority of economics, the model's cognitive simplicity and its material means of calculation (MacKenzie et al. 2007, 54-86). The on-going boundary work within regulatory structures to manage distinctions between private and public information (animated by notions of 'fairness') and the legitimacy of market-making practices (as forms of 'destructive' or 'productive' speculation) is assumed to be *fait accompli*. As a consequence, lost are the variety of ways in which legal models of 'a free market' can be translated and constantly re-worked across the sites and spaces of regulatory practice into governing norms, statutory provisions, institutional arrangements and associated calculative possibilities – that is, the generative power of law (Riles (2011).

In the sections that follow, the paper traces the enrolment of 'disclosure' into the Canadian capital market and associated debate over what it means in practice, i.e. what ought to count or be considered 'material' in the valuation of shares. As will be discussed shortly, practical investments by the state and industry participants in a disclosure regime were animated largely by what investors perceived as '*the Canadian problem*' – fraud associated with the marketing of speculative shares in mineral prospecting firms. The construction of a system to govern the circulation of 'material' information proved necessary to legitimise this form of financial speculation, yet in doing so established a template for Canada's wider capital market. From the case study it is evident that 'disclosure' can be put to work in a number of ways. How legal processes frame epistemic practices, translating legal models of 'a free market' into standards and statutory requirements, can have a bearing on what forms of governance are brought into being and the kind of economy set in motion. Over time disagreement among market participants in Canada over what 'disclosure' ought to mean for financing mineral prospecting did not yield a space of convergence, centred on a shared understanding built up over the course of transactions. Even though 'disclosure' may appear as a technical given, in fact it has functioned more like a 'trading zone' (Galison 1997), a socio-technical space in which divergent understandings and commitments towards the idea

circulate, facilitating in a generative fashion the work of market coordination and legitimization in different temporal and socio-spatial configurations.

The remainder of this paper first traces Canada's importance as a place for raising equity finance for junior mining and the context in which disclosure regulations were first introduced. It then identifies three shifts in how regulators made sense of 'disclosure' in practice. These shifts reframed the significance of disclosure for the prevention of fraud: first, in terms of the well-being of mineral exploration and resource development; then, wider processes of industrialization; and finally, promoting 'knowledge industries' within the global economy. Each shift re-drew boundaries that demarcate flows of private information controlled by mining promoters from what are deemed 'material' to the valuation of shares and so should be publically available within the market making process. These shifts in interpretational practice had consequences for the governance of both issuing firms and the markets they listed upon. As such, the technical qualities of disclosure requirements were profoundly political (Mitchell 2007; Riles 2011). In the Canadian example, 'disclosure' gained traction through contingent associations forged with scale-making projects of: first, province-building; then, the construction of a national space economy; and finally, securing Canada's place within a global economy. This case study suggests that the power of the idea of disclosure resides less in an idealized notion of some sort of self-executing means of economic regulation, than in the situated politics of calculation it puts in place. Attention to the geographies of the institutions, actors, ideas and material practices that constitute these sorts of legal knowledge practices can greatly enrich our understanding of the situated logics and imperatives that animate the variegated landscape of contemporary capitalism (Peck and Theodore 2007).

Canada & resource exploration

Canada has long been recognised as a leader in mining and its financing. Fifty-seven per cent of the world's public mining companies are listed on the Toronto-based TMX Group of securities exchanges, over twice as many as its nearest foreign rival, the Australian Stock Exchange (TMX 2010). Most of these mining issuers are exploration companies with no financial interest in a producing mine. They focus on finding promising locations, evaluating the site to determine if is economically viable (i.e. 'proving'), securing the rights to the materials (i.e. 'staking') and developing a mine for production. These activities are non-revenue generating with an uncertain pay-off. As Tsing (2000) has argued, in such 'speculative enterprises, profit must be imagined before it can be extracted' (p.118) and so 'in this industry, the line between various kinds of expertise is thin: geologists (with salaries supplemented by stock options) must be promoters to raise the money to finance their mineral finds, market analysts must be geologists to evaluate those finds, and stock promoters must explain their offerings in geologically convincing terms' (p.123). Junior mining contrasts with the activities and risks undertaken by 'the majors' or senior mining companies, a relatively smaller number of large multinational firms that concentrate on mineral production, processing and marketing activities. The latter dominate the mining listings in markets centred in New York and London, where the average quoted market capitalisation for a mining firm is $11.3 billion (NYSE/AMEX) and $3.4 billion (LSE/AIM) respectively. On the TMX group of exchanges, by comparison, the figure is only $0.4 billion.

Canada's significance as a place in which to raise capital for junior mining ventures can be traced back to mineral finds in the 1890s in the Rocky Mountains of British Columbia, and later in the Pre-Cambrian Shield of northern Ontario (Armstrong 1997). These discoveries served to popularise trading in highly speculative 'penny stocks'. Growing public interest in these types of shares drew upon prior investments by scientists, commercial interests and the state in constructing what Braun (1997, 2000) has described as a 'geological vision' of the new country. The Geological Survey of Canada's (GSC, established 1842) regular output of reports, sketches and maps won praise nationally and internationally as reliable guides to mining enterprise. These publications amounted to more than the enumeration of Canada's mineral wealth. Rather, they were part of broader efforts by provincial and federal governments to generate a geologically literate public at home and abroad, presenting investment opportunities in Canadian mining as an 'as an exercise in reason, rather than speculation' (Braun 2000, 31).

Under the terms of Canadian confederation, powers over land and resources were ceded to provincial governments. It was left to provincial legislatures and their administrative agencies to determine how to regulate the distribution, use and financing of what were now cast as Canada's 'mineral lands'. Legislation emerged in the wake of gold rushes in California (1849), Australia (1851) and New Zealand (1857), mirroring those jurisdictions' 'free entry system' (Leshy 1987; Bakken 2008). This separated surface from sub-surface property rights, privileging mining interests over and above other pre-existing claims to the land, whether indigenous or settler (Barton 1993). Dis-entangling sub-surface property rights from other claims was regarded by state officials as necessary as providing physical infrastructure (roads, railways and ports) in promoting investment in the 'resource frontier' (Ontario 1890). Together, geological and legal practices made legible to power a space of administration, advancing the frontiers of the Canadian state (Zaslow 1975), configuring the imagined geographies of a transcontinental nation (Zeller 1987; Baldwin, Cameron and Kobayashi 2011) and incorporating new territories into imperial forms of political and economic calculation (Stafford 1990).

As the state harnessed both private initiative and its own resources to administer its territories as a geological resource, financiers in Toronto and Montreal seized upon the opportunity to promote the sale of 'penny' shares in mineral exploration companies. On the trading floors of the cities' stock exchanges (founded in the 1870s), penny stocks were sold alongside opportunities to invest in banks, insurance companies, railroads and utilities, seeming to guarantee in the minds of investors the liquidity of mining investments. Whereas shares in banks and utilities commanded prices beyond the reach of most salaried workers and wage earners, penny mining stocks offered many the prospect of handsome dividends and capital gains if there was a rich strike of minerals. Armstrong (1997) notes that most investors in junior mining ventures at this time 'knew little and cared less about geology or mineralisation, but all were eager to get in on the ground floor and ride a stock for as much profit as they could' (p.27). By the 1920s low-priced shares in 'juniors' came to serve as vehicles for extending share ownership beyond the ranks of the financial elite, drawing in retail investors from across North America. However unscrupulous sales techniques, false and misleading claims and share price manipulation quickly earned mining promoters and their brokers operating out of Toronto international notoriety. In the wake of the Wall Street Crash, one of the first initiatives the United States' Securities and Exchange Commission (SEC) undertook was to address what had become known as '*the Canadian problem*': the

unlicensed cross-border marketing through letters, telegram wires and telephone calls of highly speculative unregistered Canadian mining shares. The high-pressure sales techniques of Toronto's boiler rooms sought to capitalize upon the staging of Canada as a 'resource frontier', conjuring the prospect of wealth from the spaces in between the drill holes that animated revisions to the GSC's *Geological Map of Canada* (1869).

By the late 1930s, exploitation of prospectors' knowledge claims by Toronto's boiler rooms and a series of scandals involving the salting of drill hole cores, severely eroded public confidence in Canada's capital markets and its mineral exploration firms in particular. A sustained publicity campaign by the SEC and non-profit Better Business Bureau to stem the flow of marketing communications and mining shares across the U.S. border helped push Ontario's government to convene a *Royal Commission on Mining* (Ontario, 1944). Canada's dependence on external investment to fund its economic development, in particular from U.S. residents, figured prominently in the Commission's deliberations. Significantly, its report linked promoting the mining industry with fraud prevention. It argued that existing securities legislation should be repealed as it had a 'retarding influence' on mining in failing 'to solve the problem of preventing fraud in the sale of securities'. It concluded that fraudulent activity had reached 'serious proportions', 'hampering the financing of legitimate mining development'.

Making space for disclosure

Until this point the prevention of securities fraud relied upon the by-laws and initiative of stock exchanges and the investigative powers of each province's Attorney General. In 1928 Ontario passed the *Security Frauds Prevention Act* (SFPA), requiring the registration of all brokers and salespeople, empowering courts to suspend them where fraud was proven and strengthening the Attorney General's powers. However, reliance on the latter's resources and the burden of proof required by the courts proved largely ineffective (Armstrong 1997). Further public resources were directed at the issue in 1931, with the creation of a specialized tribunal to enforce legislation, eventually named the Ontario Securities Commission (OSC). Yet reliance upon the deterrence of well publicized investigations, broker registration and self-regulation was evidently not adequate to address '*the Canadian problem*'.

Recognising the moral and political challenges that threatened to stem new financings, the *Royal Commission on Mining* argued that public confidence in mining securities depended on some form of assurance that market practices could be trusted as ethical. It suggested this assurance should be provided by regulation; interventions to ensure the public be given '*a fair run* for its money'. It advocated measures to govern the circulation of knowledge among prospectors, their promoters and the investing public; measures that would 'demand personal integrity and financial responsibility' of brokers and ensure 'the reasoning person' had access to 'all the important facts' considered necessary to judge a share's worth in relation to his or her best interests. The specific regulatory strategies recommended were, firstly, a new form of registration for brokers requiring applicants to provide evidence that they met 'the ordinary standards' for 'fair dealing' and, secondly, a requirement that issuers circulate a standardized prospectus before any new issues are sold to the public, *disclosing* key information in advance of a company's initial public offering (IPO).

As a regulatory ideal, 'disclosure' is grounded in legal constructions of 'fairness' or 'equity' and rooted in a longer standing belief in the goal of transparency, the struggle for which is considered a hallmark of liberal government (Scheppele 1988; Sunstein 1990; Sarra 2007). As a regulatory technique, disclosure was championed in the early twentieth century by legal realists such Brandeis (1914), Berle and Means (1932) and Frankfurter (1933), and became the cornerstone of the U.S. securities regulatory framework established under Roosevelt's New Deal (Williams 1999; Wang 2010). For Brandeis, 'disclosure' was a means to an end – a regulatory strategy that could bring pressure to bear from shareholders and the wider public on the activities of powerful market insiders. This, according to Berle and Means, would make those who hold economic power more accountable. Frankfurter, who was instrumental in guiding the Securities Act (1933) through Congress, argued publicity could transform the 'competence and character' of corporate managers, bankers and accountants, as 'many practices safely pursued in private lose their justification in public' (1933, 55). Disclosure, he maintained, was 'essential to a fair judgment upon the security offered' (op. cit.), enabling the public to efficiently and accurately value securities, thereby affecting 'business morals'. In contrast to past reliance on deterrence-based measures, this marked a critical departure in market governance, placing a legal responsibility for the public circulation of accurate, timely 'material' information in the hands of market insiders.

Whereas in the United States the introduction of mandatory disclosure was framed in terms of making those who hold economic power more accountable, in Canada it was introduced a decade or so later with a very different frame of reference. It was the *Royal Commission on Mining* (1944) that successfully advocated its introduction, arguing that adapting U.S. practice was necessary to shore up confidence among investors in financing the development of Canada's resource economy. Further to this end, whereas in the United States the SEC was granted sweeping discretionary powers, advancing the regulatory state (Rittich 2005), in Canada the Commission argued the OSC's powers be clearly defined, curtailed and limited to the administration of government policy, namely promoting resource development (Coleman 1994; Condon 1998). If the OSC controlled the terms of entry to the brokerage profession and had oversight of the production and circulation of information at the point of initial public offering (IPO), it was envisaged that the market itself would govern the flows of information and sales practices in a self-executing fashion. For Ontario these measures intended to displace moral and political concerns with utilitarian ones (economic development), while making legible to state administrators elements of the market making process.

The credibility of Ontario's mining industry loomed large as an organising principle for provisions within the province's *Securities Act (1945)*. However, contrary to the spirit of the Commission's report, the OSC was offered no guidance in the legislation on *how* to determine 'the integrity' of those who applied to be registered as brokers, nor *what* constituted 'full, true and plain disclosure of all material facts' in a prospectus. Rather, in transferring jurisdiction for securities regulation from the courts to an administrative agency (i.e. the OSC), the new Act granted the agency substantial discretionary powers to pursue its standard-setting task and statutory mandate (Baillie 1965). This said, the legislation *also* demonstrated continued faith in the self-regulatory capacities of recognized stock exchanges. The Act provided for members of exchanges and issuers listing on them to be exempted from OSC regulatory scrutiny (Coleman 1989). As Barkan (2011) notes, states have long granted such legal privileges in business, trade and finance to promote and maintain

particular regimes of accumulation. Consequently, what amounted to a form of 'regulatory expansion' (Levi-Faur 2005), not only included the creation of a regulatory agency and development of new technologies of regulation through rule making and enforcement, but also ring fenced from state oversight those market-making activities controlled by self-governing bodies. This approach mirrored that pioneered in the United States by the SEC a decade earlier, conceiving of the task of regulators as stimulating self-regulatory vigilance where there was scope for extreme opportunism (Abolafia 1996; Seligman 2003). In seeking to 'clean up' the financing of Ontario's junior mining sector, the provincial legislature had established a template for the governance of securities markets in general, one that other Canadian provinces soon emulated.

Making sense of disclosure

With the passage of Ontario's *Securities Act* (1945), the newly empowered provincial regulator set about working with other stakeholders to translate the idea of 'disclosure' into procedural norms, seeking to codify existing practices as standards to govern the circulation of information. Significantly, its initial deliberations over the practical meaning of 'full, true and plain disclosure' pivoted around what the agency understood to be its role in realising provincial government policy. Early decisions and judgments by the OSC over what should and could not be circulated within a prospectus accorded greater significance to the language of risk-taking in the interests of economic development rather than paternalistic investor protection. As Hess (2007) notes, there is a politics to knowledge dissemination. For example, an article in the *OSC Bulletin* (April 1949) stated, 'if the basic concept of the administrative authorities is that the public should never risk capital but only embark on "sure things", there is good reason to believe that exploration and primary development would either cease or become the sole right of the big companies. On the other hand, the public can participate and enter into these speculations with eyes wide open and with full knowledge of all material facts, where a prospectus of the type required under our type of securities legislation is required' (quoted by Condon 1998, 30). Consequently, given the uncertainties such enterprises managed and the how the OSC understood its mandate, the regulator initially viewed its role in policing the circulation of information as quite limited.

The OSC's framing of disclosure resonated with a widely held notion that most of country's great mineral finds had been made by lone prospectors pursuing hunches, each embodying what society could gain from speculation, enterprise and scientific exploration. For example, in 1939 at the annual meeting of the Prospectors and Developers Association of Canada (PDAC), a mining executive repeated often rehearsed praise of the entrepreneurial virtues of independent prospectors and their collective contribution to the nation's prosperity, arguing: 'let the government recognize prospecting for what it is: an out-right gamble … Surely it is better that a man should gamble on a prospect than on a racehorse or an Irish Sweepstake. On this, if you lose, you lose. When money is gambled on prospects, if you lose, that money stays in Canada and more is known about mining country' (quoted in Armstrong 1992, 98). Throughout the 1940s and 1950s junior mining firms, financiers and their regulators framed controversies over the knowledge claims circulated in company prospectuses, the media and cold calls in terms of productive speculation, province building and knowledge making. In doing so, they sought to displace moral and political anxieties about the culture of investing in mineral exploration with notions of a national spirit and its wider economic and scientific significance (cf. Preda 2009). However, as Armstrong (2001) details, waves of fraudulent

'drill hole' promotions continued to threaten the sector's fragile reputation, undermining confidence in the country's capital markets at large. At one point in 1964 three public enquiries were concurrently investigating various aspects of the financing of exploration activities (see Canada 1964; Ontario 1965a; 1965b). A common thread that traversed each of these was the subject of disclosure, in particular the ability of shareholders and other investors to access accurate and timely 'material' information.

Illustrative of this was a scandal that involved the president of PDAC, Viola MacMillan (see Ontario 1965b; Condon 1998; Armstrong 2001). In 1959 a major American mineral producer, Texas Gulf Sulphur, began a systematic aerial geophysical survey and drilling programme of the Precambrian Shield around Timmins, Ontario. In April 1964 it issued a press release in New York announcing it had discovered a significant ore body (copper, zinc and silver) and had secured mineral rights for the surrounding properties. On hearing the news, Viola MacMillan made a locational bet, purchasing from local prospectors a claim surrounded on three sides by Texas Gulf lands and selling the claim to a company she and her husband controlled - Windfall Oils and Mines. By July the MacMillans had a drill team on site and rumours began to circulate about the value of minerals it had discovered, fed in part by misleading statements, unusual halts in the drilling programme and unexplained delays in sending the cores to an assay laboratory. The MacMillans groomed the market for Windfall shares, even though they knew as early as July 6th that the drill cores contained nothing of commercial value. However, optimistic statements released to the press, the theatrics of a fitful drilling programme and the circulation of rumors encouraged investors to speculate on the future value of the company's mineral claims. By July 30th, when assay results were finally made public and the stock price collapsed, the MacMillans and other insiders had netted over $1 million (Canadian) from the disposal of their shares.

Re-mapping the institutional basis of warrant

The Windfall scandal highlighted shortcomings in existing practices of self-regulation and the inadequacies of a system of disclosure that relied upon *only* the point of primary distribution of shares. Two major reviews of banking, finance and securities legislation undertaken at the time, one federal (Canada 1964) and the other provincial (Ontario 1965a), found that existing arrangements did not provide investors with an adequate *amount of information*. In addition, the Windfall affair exposed to public scrutiny the ways in which mining promoters marketed shares in the secondary market, manipulating prices through the carefully timed orchestration of well crafted rumours, leaks and official press releases. The Windfall enquiry (Ontario 1965b) concluded that this was commonplace, arguing a key issue was the *accuracy of information.* The report went so far as to characterise the membership of the Toronto Stock Exchange (TSE), Canada's primary securities exchange, as 'a private gaming club' (Ontario 1965b, 97) maintained for the benefit of insiders. This highlighted a persistent problem with the institutional basis of warrant established under the *Securities Act (1945)*; allocating responsibility to self-governing bodies for ensuring the accuracy of information circulated to investors on exchange-listed stocks.

Exemptions granted to stocks listed on the TSE had served to marginalize the influence of OSC oversight, entrusting the practical implementation of disclosure requirements to members of the exchange. Under the Act, legal exemptions in effect corralled broker-dealers who continued to operate in the Over-The-Counter market (OTC) within a space subject to

state surveillance and regulation. While this represented an extension of legal authority over an element of the junior market, it also delimited intervention by assigning those mining stocks listed on exchanges to a space exempt from direct bureaucratic oversight, demarcated by assumptions regarding the probity and collective interest of exchange members (cf. Barkan 2011). However, the Windfall report questioned this arrangement and highlighted conflicts of interest, arguing the primary distribution of mining issues was no longer compatible with the TSE's function as an exchange. Countering this, the exchange asserted that members' experience, personal knowledge and professional integrity ensured the TSE was in fact guarantor of the public interest. Surprisingly the provincial regulator supported this, arguing that if the distribution of mining securities moved off the exchange and onto the OTC market, which the OSC regulated, the market would be open to even more manipulation (see Condon 1998, 64-68). The OSC maintained that the agency would be more effective in meeting public policy objectives if granted enhanced powers of oversight of self-governing bodies, not the market-making process itself.

Consequently with the passage of a new *Securities Act (1966)*, trust in the capacities of the exchange to regulate its members' market-making activities prevailed. However the OSC was granted new sweeping powers to ensure that the exchange would undertake its regulatory responsibilities. So even though the idea of responsible self-regulation continued to prove persuasive, under the new Act the OSC was granted authority to require procedural reforms of the exchange and to oversee its disclosure practices, marking a significant extension of legal authority. Even though the OSC moved slowly to exert its new powers, the exchange itself did not delay in deferring to the political debates out of which the new legislation had emerged. By the close of the 1960s it had appointed its first non-member president, revised rules governing floor trading, introduced a department for market surveillance and helped develop an accredited system of national qualifications for market professionals (Majury 2007). Positioning itself as guarantor of 'the public interest', the TSE also introduced enhanced disclosure requirements, including the production of both a preliminary and final prospectus in the course of primary distribution, the publication of annual and interim financial statements by issuers, and a requirement that statements on the financial position of a listed company be accompanied by an accredited auditor's judgment. Through such initiatives, Ontario's capital market inched towards a formal system of 'continuous' financial disclosure – the *Securities Act (1978)* - an 'evergreen' circuit of standardized financial information, up-dated in a more 'timely' fashion, verified by professionally accredited auditors.

Mobilizing disclosure in different registers

What at first may have appeared under the new legislation as a straightforward regulatory strategy - enhanced disclosure - in practice actually involved elements of judgment that soon exercised both the TSE and OSC in adjudications and policy directives. Although the legislation maintained that the OSC should not exercise judgment on the merits of an investment (this was for the investing public to do), it did grant the regulator discretionary powers to ensure the terms of a purchase advertised within any prospectus were 'equitable' between parties and that mining promoters were not making 'unreasonable' profits at the expense of the investor. Under these provisions, the meaning of 'disclosure' proved sufficiently malleable to incorporate situated judgments by the OSC and TSE about equity, reasonableness and the balancing of harms among investors, mining promoters and issuers.

What was at stake here was the governance of listed firms (specifically the interests of corporate insiders vis-à-vis the investing 'public') and the market as a whole (in challenging market insiders' power to establish interpretative norms).

Whereas in the 1950s disclosure requirements were narrowly interpreted in terms of assisting capital formation and the resource economy, by the late 1960s, under the OSC's direction, fraud prevention began to be reframed in wider terms than solely maintaining 'the well-being' of mining. This 'interpretative turn' unfolded neither abruptly nor without tension. For example, reflecting past practice, in 1968 an enquiry into financing mineral exploration, the *Beatty Enquiry* (OSC 1968), arranged public hearings for representations from 'prospectors, developers and others associated with the financing of mining exploration and development companies' but not, significantly, from investors. Still sympathetic to the concerns of mining promoters, the OSC proved willing often to recognize situations where public disclosures could cause 'harm' to the issuer sufficient to out-weigh any likely consequences for shareholders. However, ceding to industry interests in exercising discretion was increasingly countered by instances where the OSC required issuers to introduce safeguards intended to 'balance' interests, re-shaping governance arrangements. 'Disclosure', it seemed, proved sufficiently pliable to be mobilized in different registers than had prevailed in the past (cf. Galison 1997). Examples include judgments on the number of shares that could be underwritten by a speculative mining company (*Great Pine Mines* in OSCB 1966a) and the nature of payments due to promoters upon the sale of their shares (*Prima* in OSCB 1966b), positioning the agency as an advocate for shareholders in transactions with promoters.

By the turn of the decade the OSC began putting the idea of disclosure to work to broker a more diverse set of interests than had hitherto prevailed. Tellingly, in *Maybrun Mines* (OSCB 1969), the OSC turned down the issuer's application to be exempted from filing a prospectus, arguing 'we have confined ourselves to considerations of the public interest in the protection of the investing public (which is within our jurisdiction) and have excluded considerations of the interests of a different and wider public in the discovering and bringing into production of new mines (which is outside our jurisdiction)' (op. cit. 169). Acknowledging that the public interest could be framed in terms other than just the promotion of mineral exploration, this judgment signaled a shift in regulatory practice, ultimately encouraging the province's most controversial mining promoters (dubbed 'stockateers') to seek out more amenable regulatory regimes, such as British Columbia's 'venture exchange' (the Vancouver Stock Exchange) (Wells 1991, VSE/BCSC 1994). Working with a chastened TSE, the OSC sought to shore up confidence among investors in the 'investment image' of Canada (see *Meta Uranium*, OSCB 1967) by increasingly translating a wider array of political claims into the configuration of the public and private information flows that constituted Ontario as a space for capital raising activities.

Reframing the market: 'balancing interests' through 'disclosure'

This shift in the practical meaning of disclosure reflected not just the 'dynamics of profit and prudence', whereby opportunism and legitimacy animate market politics and institutional change (Abolafia 1996). It also reflected a re-configuration of the frame and scale of reference of the associated sites and spaces of regulatory practice associated with: Ontario's industrialization and growing ambivalence among an increasingly influential segment of TSE

members towards the junior mining sector; changing attitudes towards the influence of foreign direct investment on the structure of the country's development; and a re-appraisal of the role of junior mining firms in advancing geological knowledge.

During the 1960s divisions emerged within the TSE between those brokers that specialised in promoting speculative mining issues and those who provided services for 'blue chip' issuers. With the rapid post-war industrialization of Ontario's economy, the interests of 'blue chip' brokers began to hold sway in the governance of the exchange. Institutional reforms implemented after the Windfall scandal ensured mining promoters had less influence in both the daily operations of the TSE and the internal regulation of its activities (Armstrong 2001). At the same time, by virtue of the province's economic dynamism relative to the rest of Canada, Ontario's capital markets assumed strategic significance for a wider project of national economic development. By the late 1960s a critique of past reliance on foreign direct investment (FDI), in particular American, re-framed resource extraction in terms of dependency, and FDI more generally in terms of the immobilization of Canadian manufacturing's innovative capacities (e.g. Canada 1968; Ontario 1971; Canada 1972). Foreign control of the economy had, it was argued, 'arrested' Canadian industrialization. Reframing national economic space in these terms positioned capital formation and the role of Ontario's securities markets at the centre of wider debates about engineering *Canadian* economic development (Clement and Williams 1997).

The political and institutional marginalization of mining promoters was furthered by some who questioned long-standing assumptions that junior mining performed a key role in advancing knowledge of the country's geology. Significant in this respect was Cork's (1962) brief for a federal review of the future of Canadian banking and finance (Canada 1964). Cork queried whether resource development would be impeded if fuller disclosure requirements discouraged the flotation of new junior mining issues, citing evidence that 86% of prospecting activity in Canada was financed by the majors using retained earnings. Historically, he argued, the majority of commercially significant finds had been discovered by these firms, not independent prospectors or 'juniors'. Indeed, returns for investors on 'surface prospecting', the favoured technique of independent prospectors, seemed to be diminishing. Instead, large mining companies, investing in systematic programs of aerial geophysical survey, had the means to identify 'anomalies' that could be subjected to further targeted ground-level testing and sampling.

By the 1970s one OSC study was bold enough to publically question 'junior mining's' very purpose. It reported that only a relatively small proportion of money raised through the sale of shares was actually spent on exploration activities. Typically just 40% went to the company's treasury, whereas 11% went to the underwriter-promoter and 49% to the broker-dealers who marketed the stock. The study concluded that 'involving broker-dealers in the raising of funds for junior exploration is like sending the fox to feed the chickens' (quoted by Armstrong 2001, 277). This re-appraisal gained force as Ontario's legislature formalized the OSC's legal authority over the affairs of the markets' self-governing bodies and the OSC exercised its powers to define 'disclosure' in terms other than just securing finance to develop the province's resource economy. With this the notion of 'the investor' to be protected in governmental discourse shifted from patriotic risk-takers (who were to be given '*a fair run* for their money') to the prudent saver, whose confidence in investing in Canada could be secured through enhanced compliance by issuers and interpretative acts by the

OSC and TSE in 'balancing interests' (cf. O'Malley 2004). Consequently, the practical meaning of 'disclosure' pivoted increasingly around the perceived impact of speculative mining finance on the ability of *other* Canadian industrial sectors to raise share capital, re-working its frame and scale of reference, informed in important ways by a wider politics of market making and statecraft.

Uncertainty, enterprise and governing knowledge

In the introduction to this paper it was noted that the speculative nature of financing mineral exploration in part stems from how the physical qualities of specific geological phenomenon can disrupt commodification processes. As the Windfall Oils and Mines scandal illustrated, mining promoters have proven adept at exploiting in an entrepreneurial fashion the provisional nature of geological knowledge. Consequently, a perennial problem for investors has been handling not just the indeterminacy of scientific claims, but also the social basis of associated epistemic practices (Schaffer 2002). Entrepreneurs who start up and provide the initial backing for exploration firms typically draw upon past experience gained as a geologist, engineer or promoter in the mining sector. As such, the line that distinguishes different forms of expertise is thin, as investment opportunities must be explained in geologically convincing terms. Since 'profit must be imagined before it can be extracted' (Tsing 2000, 118) in such ventures, handling the indeterminacy of prospectors' knowledge claims within public disclosures is fraught with conflicts of interest. However, as Ontario's *financial* reporting practices were being re-worked during the 1960s and 1970s, regulators continued to rely upon quite basic, industry-led practices to govern the reporting of scientific claims, that is, *technical* disclosure. It was not until the 1990s, with the collapse of Bre-X (a gold prospecting firm working in Indonesia), that the quantity, qualities and timeliness of technical disclosure and the associated institutional basis of warrant became sufficiently politicized to prompt regulators to re-evaluate the implicit trust they and the public had vested in technical information.

Technical disclosures introduced under the *Securities Act (1945)*, subsection 43(5), were basic: a property's known history; means of access; the character, extent and condition of the development; and a description of any work done by its present management. Over time, these requirements were added to. From 1949 a report's author had to demonstrate that he or she was exercising independent judgment, having no financial interest in its reception. By 1956 a map of the property had to be included (Frohberg 1960). However, terminology remained ill defined and loosely applied. It was not until the introduction by the OSC in 1967 of *Form 11* that reporting of estimates of mineralization was first codified. This linked deposits that might be mined and sold at a profit, 'ores', to a classification agreed by the Association of Professional Engineers of Ontario (PEO) in 1963. Adopting the industry's norms (cf. Dashwood 2007), *Form 11* translated degrees of geologic assurance into marketable financial risk, tethering the system of warrant to conventions fashioned through the training and experience of PEO members (Hoover 1909; Blondel and Laskey 1956, PEO 1963). This effectively displaced ethical considerations from questions of trust, embedding trust within technical expertise. This approach was rolled out nationally under National Policy (NP) 2-A (CSA 1971) and NP 22 (CSA 1983). By the 1980s other jurisdictions, led by the United States, began to qualify 'economic feasibility' further in terms of technological, legal, environmental and political contingencies (McKelvey 1972; USBM/USGS 1980; SEC 1992). However, Canadian regulators retained the PEO system, offering mining promoters greater

latitude in the sorts of knowledge claims that could circulate within technical disclosures (Micon 1998).

The uneven use of terminology for technical reporting purposes internationally helped sustain Canada's reputation as a favorable environment within which to raise finance for junior mining. This assumed particular significance as the mineral prospecting and extractive industries globally embarked upon complex and far-reaching changes during the 1980s. Incremental innovations in the technology of exploration cumulatively delivered dramatic reductions in costs. In addition advances in data processing drove a shift in methodologies from traditional approaches that make reference to regional analogues towards a new emphasis on modeling basic principles (Bridge and Wood 2005). To a degree this undermined the value of place-based, regionally specific geological knowledge accumulated over time and opened up opportunities for new entrants to apply their expertise in distant countries and unfamiliar environments. In parallel with this, new opportunities were created for mining firms to apply these techniques overseas with the liberalisation of investment regimes and mineral exploration laws in many developing countries (Otto 1997; Bridge 2008; Emel and Huber 2008). While mergers and acquisitions increased the controlling influence of large multinational integrated companies within the sector, growth in out-sourcing of up-stream activities, coupled with falling exploration costs, sustained an increasing number of small and medium-sized junior firms listed in Canada, but committed to overseas exploration.

Amidst these structural changes within the mining industry globally, the Bre-X scandal dramatically exposed fragilities within the system of metrology with which geological 'facts' were produced and circulated within the juniors' market (Gould 1998; Wells 1999; Tsing 2000; 2005). In 1994 Bre-X announced assay results from drill cores it had taken in Busang, East Kalimantan. This prospecting claim had previously been abandoned by a senior Australian firm, however Bre-X claimed its own drill team had discovered a major gold deposit. Fuelled by speculation circulating on digital media, its share price climbed from $0.51 (Canadian) in 1993 to a peak of $286.50 by 1996. With a market capitalisation of over $6 billion, Bre-X was inter-listed both the TSE and NASDAQ. However, additional assays undertaken the following year by a senior American firm which was in the process of brokering a partnership, found nothing of commercial value in Bre-X's samples. Indeed, evidence suggested the cores had been 'salted' with stream-rounded alluvial gold. This scandal prompted the OSC and TSE to establish the *Mining Standards Task Force* to enquire into the disclosure issues Bre-X and other contemporaneous mining scandals raised. These frauds included not only salting of cores, but also unreliable proprietary sample preparation and assay methods, mis-representations of visual field estimates as drilling results, overly optimistic geological reports and even, occasionally, human error.

The Task Force's recommendations (TSE/OSC 1999) were implemented under *National Instrument (NI) 43-101 - Standards of Disclosure for Mineral Projects* (CSA 2001) – replacing *NP 2-A* and *NP 22*. As in the past, measures were justified as necessary to shore up confidence in Canadian capital markets and promote economic development. However, whereas previous disclosure regimes were framed in terms of the relative significance of prospectors in producing wealth *within* Canada (i.e. debate over Canada as a 'resource economy'), these reforms were framed in terms of Canada as a 'knowledge-based economy' (OECD 1996; Gertler and Wolfe 2004; Jones et al. 2005) and support for the *export* of expertise in mining finance, mineral exploration, assaying and mine development. At the

heart of the reforms it devised were strategies to formalise, institutionalise and re-scale the system of warrant by which scientific claims can be assessed by investors. This involved accommodating the globally distanciated connectivities and informational flows that now characterise significant elements of the junior mining sector in Canada, putting in place market infrastructure that recognises and works with the micro-orders of industry practices, the contingent relations that constitute 'value' across diverse sites of exploration, and foreign regimes of reporting and valuation. In doing so, NI 43-101 drew upon regulatory strategies forged earlier in relation to the disclosure of financial information: trust was formally vested in self-governing bodies, industry expertise, and the generative power of 'disclosure' (cf. Levi-Faur 2005, Riles 2011).

Firstly, the legislation formally tasked a self-governing body of professionals, the Canadian Institute of Mining, Metalurgy and Petroleum (CIM), with revising Canada's system for classifying commercially significant deposits (NP 2-A). Illustrative of the structural couplings that now bind together international economic actors within this element of the 'knowledge economy' (Teubner 1992; Dezalay and Garth 2002), CIM was required to work with the national reserve committees of Australia, South Africa, UK, Chile and USA to establish a framework for translating Canadian practice into common terminology, standardised definitions and 'best practice' guidelines (CIM 2000; 2005; 2010). The standards CIM devised and Canadian regulators recognized do not impose some arbitrary, internationally benchmarked, form of precision. Rather, they work with the indeterminacy of scientific knowledge claims, creating a space in which situated legal understandings of 'fairness' can frame epistemic practices, deploying notions of 'reasonableness' in judgments about 'economic feasibility' and 'value'.

Secondly, NI 43-101 restricted authorship of a technical disclosure to those who could verify they were 'competent' to make such judgments on the economic significance of geological 'facts'. 'Competency' was defined in terms of professional accreditation as a 'geoscientist' or 'engineer' and at least 5 years of relevant industry experience. In formally anchoring the notion of 'competent person' to Canadian self-governing professional bodies, these institutions were required to ensure there was provision for 'public welfare' in their codes of ethics and associated disciplinary mechanisms. At the same time, securities regulators established a system for vetting and recognizing the expertise and governance arrangements of foreign accrediting professional bodies. In extending their authority through the formal recognition of accrediting bodies, Canadian regulators delegated practical responsibility for regulating the production and circulation of scientific claims to a rule of experts, constituted through a globalising network of self-governing associations of professional engineers and geoscientists (Mitchell 2002; O'Neill 2002). Given the provisional nature of prospectors' knowledge, where uncertainty is the norm, private regimes of self-regulation have been formally drawn into regulatory strategies to handle the social basis of epistemic practices.

Finally, the legislation also mandated disclosing the provenance of scientific data, including details of the identity of the assay laboratory, its relationship to the mining company and whether its processes met international standards established under *ISO/IEC Guide 25* (ISO 1990). Requiring the public dissemination of information on the institutional geographies of devices, individuals, organizations and sites of scientific testing and evaluation, serves a ritual function (Power 1999). It assumes the 'value' of scientific data is best secured through

the demands that traceability place on market participants to exercise 'reasonable expectations' and foresight (O'Malley 2004 in contrast with Beck 1992), holding the brokers of knowledge to account, and echoing earlier arguments made by legal realists with regards to financial disclosure.

Concluding Remarks

If we accept, as Boeckler and Berndt have argued, that "a world 'after markets' will only emerge on the terrain of 'markets' themselves" (2012, 1), then it is incumbent to understand what holds particular market orders in place. As Boeckler and Berndt provocatively go on to ask, 'what is it that holds neoliberalism in place even though its core principle, that is self-regulated markets, has itself proven to be a failure?' (p.2). In tracing the application of the legal concept of 'disclosure' and shifts evident in its practical application, this paper has argued that 'economics', though necessary for the construction of markets, is by no means sufficient. Analytical emphasis on the work of 'economics' within 'the performative turn' (e.g. MacKenzie 2001, Caliskan and Callon 2009; 2010) tends to under-estimate the significance of the 'methods of control and trials of strength' (Mitchell 2007, 245) that are routinely mobilized in market-making processes, steering reflective human cognition and action (Stark 2009). The power of legal knowledge practices, such as 'disclosure', stems not from self-executing capacities to govern markets, but rather from their polyvalent qualities. 'Disclosure' may appear as a technical given, however as the case study illustrates, divergent understandings and commitments towards the idea circulate. Since its introduction to address '*the Canadian problem*', the practical significance of disclosure as a regulatory technique has been reframed in terms of: firstly, the well-being of Ontario's resource economy; then, wider processes of Canadian industrialization; and finally, promoting Canadian 'knowledge industries' within the global economy. Each shift in interpretational practice attempted to codify and shape the circulation of information deemed by regulators as 'material' to the valuation of shares. These practices drew upon a liberal 'imaginary of entrepreneurial calculation that is pragmatic and situational, rather than abstract or quantifiable' (O'Malley 2004, 92). Given the implications of associated judgments for the governance of junior mining firms, the markets they listed on and the type of economy they helped put in motion, it is clear that there is a political economy to the geographies of knowledge dissemination within markets, differentially empowering different types of stakeholders (Rittich 2005; Hess 2007; Dhir 2009).

This argument also has bearing for our understanding of the re-scaling of economic regulation associated with globalization and the emergence of sectoral regimes of transnational authority. Sassen (2009) has characterized such emergent sectoral regimes as 'transversal borderings', 'chipping away' at what historically has been constructed as the authority of state institutions and actors per se. However, as this case study evidences, claims about the novelty of the extension of market-like rule through the generation of norms, rule-making and efforts to 'enhance' self-regulatory capacities in the shadow of the state, often fail to consider how the re-configuration of markets under globalization is predicated upon liberal legal regimes and a long history of states granting legal privileges to promote and maintain particular regimes of accumulation (see Barkan 2011). Work invested by Canadian regulators to convince investors to 'trust the numbers', to enable them to distinguish between 'productive' and destructive' forms of financial speculation, has entailed working closely with private regimes of self-regulation and been framed by wider strategies of

statecraft. The knowledge practices that channel and bind associated market-led governance arrangements are 'creatures and creations of grounded processes of institutional reproduction, regimes of discursive framings and contours of political power' (Peck 2011, 793), and as such, are transformed by their journeys across sectors and over space. This raises as a matter for enquiry how the situated rationalities that make distinctions between 'knowing things' and 'knowing people' (Schaffer 2002), 'value' and 'values' (Thevenot 2009), 'market economies' and 'moral economies' (Sayer 2007; Tsing 2009), come to delineate particular geographies of marketization and a wider politics of calculation.

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